Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI • EXAMINATION – WINTER • 2014

Subject Code: 160703 **Date: 01-12-2014**

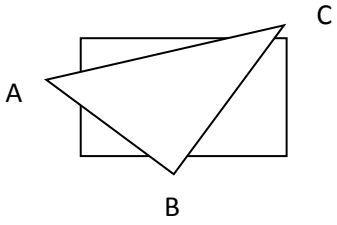
Subject Name: Computer Graphics

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain scan line fill algorithm. What is the use of edge table and active edge list?	**07**
	(b)	1. Explain shadow mask method.	**03**
		2. How long it would take to load a 640 x 400 frame buffer with 12 bits per pixel, If 10^6 bits can be transferred per second?	**02**
		3. Define aspect ratio. If image of size 1024 x 800 needs to resize to one that has 640 pixels width with the same aspect ratio, what would be the height of the resized image?	**02**
Q.2	**(a)**	What is aliasing? Briefly explain anti-aliasing techniques.	**07**
	(b)	Give advantages and disadvantages of DDA algorithm. Draw a line from (20,10) to (30,18) using DDA algorithm.	**07**
		OR	
	(b)	1. Explain trigonometric method for circle generation.	**02**
		2. Discuss midpoint circle algorithm with example.	**05**
Q.3	**(a)**	1. Write 2 X 2 transformation matrix for each of the following rotation about origin (a).Counter clock wise rotation by 180^0 (b) Clock wise rotation by 90^0	**04**
		2. Explain DVST.	**03**
	(b)	Clip the line using Liang Barsky algorithm against window with (xw_{min}, yw_{min})= (0,0) and (xw_{max}, yw_{max})=(100,50). Line end points are A(10,10) and B(110, 40).	**07**
		OR	
Q.3	**(a)**	Perform 45° rotation of a triangle A(0, 0), B(1, 1) and C(5, 2). Find transformed coordinates after rotation, (a). About origin, (b) About P(-1, -1)	**07**
	(b)	Write the Sutherland – Hodgeman polygon clipping algorithm. Using it clip the given polygon against the clipping window.	**07**



Q.4	**(a)**	What is Bezier Curve? Define properties of Bezier Curve.	**07**
	(b)	What is Parallel Projection? Explain in details types of Parallel Projection.	**07**
		OR	
Q.4	**(a)**	What is window and view-port? Retrieve equation for the scaling factor to map the window to view-port in 2D viewing system.	**07**
	(b)	Write a Short note on:	
		1. 3D Rotation	**04**
		2. 3D Translation	**03**
Q.5	**(a)**	1. Define: Complementary Colors, Saturation, Luminance	**03**
		2. Explain various light sources.	**04**

	(b)	Explain CIE diagram with its usefulness.	**07**
		OR	
Q.5	**(a)**	Explain Z buffer algorithm for hidden surface removal.	**07**
	(b)	Explain RGB and CMY color models. How conversion from RGB to CMY is done?	**07**

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